METHOD AND DEVICE FOR CONTROLLING TRANSACTIONS RELATING TO
EXPOSURE CALCULATION OF BATCH ACCOUNT SETTLEMENT NETTING
FOR FINANCIAL ASSETS BASED ON TERMS OF MASTER CONTRACT, AND
COMPUTER-READABLE RECORDING MEDIUM WITH RECORDED
TRANSACTION CONTROL PROGRAM

[マスター契約条項に基づいた金融資産の一括生産ネッティングの
エクスポージャ算出に関わる取引制御方法及び装置並びに取引制御
プログラムを記録したコンピュータ読み取り可能な記録媒体]

KUNIHIKO TAKAI

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INVENTOR(S)	(72):	KUNIHIKO TAKAI
APPLICANT(S)	(71):	HITACHI, LTD.
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FOREIGN TITLE [54A]: マスター契約条項に基づいた
金融資産の一括生産ネッティ
ングのエクスポージャ算出に
関わる取引制御方法及び装置
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り可能な記録媒体

[Claim 1]   A method for controlling transactions relating to exposure calculation of batch account settlement netting for financial assets based on the terms of a master contract in a processing system equipped with an input device, output device, memory device, and processing device, characterized by comprising the steps of:

storing credit limits in master contract units or client units in the memory device;

generating a netting matrix based on the master contract information stored in the memory device;

calculating exposure by contract based on the contract information and market status information stored in the memory device;

calculating master contract unit net exposure or client unit net exposure based on the netting matrix and the exposure by contract;

determining whether or not the master contract unit net exposure has exceeded the credit limit of the master contract unit, or whether or not the client unit net exposure has exceeded the credit limit of the client unit; and

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[1] Numbers in the margin indicate pagination in the foreign text.

prohibiting the user from processing the recording of new contracts or processing changes to transaction contents accompanied by an increase in net exposure when the credit limit has been determined to have been exceeded.

[Claim 2] The method for controlling a transaction of claim 1, further characterized in that a warning message is outputted to the user when the master contract unit net exposure or client unit net exposure that has been calculated reaches a certain ratio of the corresponding credit limit.

[Claim 3] A system for controlling transactions relating to exposure calculation of batch account settlement netting for financial assets based on the terms of a master contract, characterized by comprising:

means for storing credit limits in master contract units or client units in a storing means;

means for generating a netting matrix based on the master contract information stored in the storing means;

means for calculating exposure by contract based on the contract information and market status information stored in the storing means;

means for calculating master contract unit net exposure or client unit net exposure based on the netting matrix and the exposure by contract;

means for determining whether or not the master contract unit net exposure has exceeded the credit limit of the master contract unit, or whether or not the client unit net exposure has exceeded the credit limit of the client unit; and

means for prohibiting the user from processing the recording of new contracts or processing changes to transaction contents accompanied by an increase in net exposure when the credit limit has been determined to have been exceeded.

[Claim 4] The system for controlling transactions of claim 3, further characterized by comprising means for outputting a warning message to the user when the master contract unit net exposure or client unit net exposure that has been calculated reaches a certain ratio of the corresponding credit limit.

[Claim 5] A computer readable recording medium, on which is recorded a transaction control program comprising:

a procedure for storing credit limits in master contract units or client units in a storing device;

a procedure for generating a netting matrix based on the master contract information stored in the storing device;

a procedure for calculating exposure by contract based on the contract information and market status information stored in the storing device;

a procedure for calculating master contract unit net exposure or client unit net exposure based on the netting matrix and the exposure by contract;

a procedure for determining whether or not the master contract unit net exposure has exceeded the credit limit of the master contract unit, or whether or not the client unit net exposure has exceeded the credit limit of the client unit; and

a procedure for prohibiting the user from processing the recording of new contracts or processing changes to transaction contents accompanied by an increase in net exposure when the credit limit is determined to have been exceeded.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention] The present invention relates to a method and device for controlling transactions relating to the calculation of net exposure envisioned for batch account settlement netting based on the contents of the netting terms of a master contract relating to financial asset-related transactions at financial

institutions and business corporations; and to a computer-readable recording medium with a recorded transaction control program.

[0002]

[Prior Art] As a method of managing the credit risk of clients in market-based transactions, the implementation of legally binding batch accounting settlement netting (in which all contractual transactions with a client are settled in a bundle) as set forth in the "Regarding modifications of the risk management checklist" (published by the Bank of Japan: January 26, 1999) and "On BIS reports relating to settlement risks in foreign exchange transactions" (Monthly Bulletin of the Bank of Japan, April, 1996 issue) is extremely effective as a means of reducing client credit risk. The adoption of exposure management taking into account batch account settlement netting (the management of the current value of financial assets) is recommended. Additionally, at financial institutions and business corporations, electronic calculation systems that manage transactions concluded with clients are divided into multiple types based on their product features. Accordingly, when a client defaults (declares bankruptcy) or the like, netting processing that cuts across electronic calculation systems becomes necessary. First, the user demonstrates

that the netting contract is legally binding, and the transactions involved are extracted. The manual recording of a whole series of operations through batch account settlement by netting of claims and debts is unavoidable.

[0003]

[Problem to Be Solved by the Invention] For the above reasons, the above manual business processing has become an impediment to operations required to rapidly recover claims when a client defaults. Further, given the complexity of netting operations, the calculation of exposure in the normal course of business is rendered extremely difficult at many financial institutions and business corporations by account settlement netting and calculation with roll over. When an emergency occurs, such as a client default, they begin batch account settlement processing and calculate their exposure after taking into account the netting of each client, creating a problem in that they end up having to forego claims greatly exceeding what was envisioned prior to the event. Accordingly, in normal business, they record and manage a portion of the credit risk based on gross base exposure (exposure to just transactions in their favor over the client) that does not take into account netting. The capturing of exposure that takes into account

legally binding netting as part of the credit risk permits more precise credit risk management. By managing on the basis of gross base exposure, there is a problem in that such financial instituations and business corporations end up assuming a greater risk burden with regard to their clients. The object of the present invention is to make it possible to rapidly respond to batch account settlement netting processing when a client defaults. A further object of the present invention is to permit precise, detailed credit risk management operations based on actual business.
[0004]

[Means of Solving the Problems] To achieve the above-stated objects, the present invention is a method for controlling a transaction relating to exposure calculation of batch account settlement netting for financial assets based on the terms of a master contract in a processing system equipped with an input device, output device, memory device, and processing device, comprising the steps of: storing credit limits in master contract units or client units in the memory device; generating a netting matrix based on the master contract information stored in the memory device; calculating exposure by contract based on the contract information and market status information stored in the memory device; calculating master contract unit net

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exposure or client unit net exposure based on the netting matrix and the exposure by contract; determining whether or not the master contract unit net exposure has exceeded the credit limit of the master contract unit, or whether or not the client unit net exposure has exceeded the credit limit of the client unit; and prohibiting the user from processing the recording of new contracts or processing changes to transaction contents accompanied by an increase in net exposure when the credit limit has been determined to have been exceeded.

[0005] Further, the configuration is such that a warning message is outputted to the user when the master contract unit net exposure or client unit net exposure that has been calculated has reached a certain ratio of the corresponding credit limit.

[0006] The present invention further consists of a system for controlling transactions relating to exposure calculation of batch account settlement netting for financial assets based on the terms of a master contract, characterized by comprising: means for storing credit limits in master contract units or client units in a storing means; means for generating a netting matrix based on the master contract information stored in the storing means; means for calculating exposure by contract based on

the contract information and market status information stored in the storing means; means for calculating master contract unit net exposure or client unit net exposure based on the netting matrix and the exposure by contract; means for determining whether or not the master contract unit net exposure has exceeded the credit limit of the master contract unit, or whether or not the client unit net exposure has exceeded the credit limit of the client unit; and means for prohibiting the user from processing new contract recording or processing changes to transaction contents accompanied by an increase in net exposure when the credit limit has been determined to have been exceeded.

[0007] The system further comprises means for outputting a warning message to the user when the master contract unit net exposure or client unit net exposure that has been calculated has reached a certain ratio of the corresponding credit limit.

[0008] The present invention further consists of a computer readable recording medium, on which is recorded a transaction control program comprising: a procedure for storing credit limits in master contract units or client units in a storing device; a procedure for generating a netting matrix based on the master contract information stored in the storing device; a procedure for calculating

exposure by contract based on the contract information and market status information stored in the storing device; a procedure for calculating master contract unit net exposure or client unit net exposure based on the netting matrix and the exposure by contract; a procedure for determining whether or not the master contract unit net exposure has exceeded the credit limit of the master contract unit, or whether or not the client unit net exposure has exceeded the credit limit of the client unit; and a procedure for prohibiting the user from processing new contract recording or processing changes to transaction contents accompanied by an increase in net exposure when the credit limit has been determined to have been exceeded.

[0009]

[Modes of Carrying Out the Invention] Modes of carrying out the present invention are described below based on the drawings. Fig. 1 shows a block diagram of an embodiment of the present invention. Numeral 101 denotes an input device, 102 denotes a memory device, 103 denotes a central processing unit, 104 denotes an output device, 105 denotes a contract information file, and 106 denotes a market information file. Numeral 107 denotes a master contract information file, 108 denotes a netting matrix information file, 109 denotes a credit limit information file, 110

denotes an individual contract exposure file, and 111
denotes a net exposure information file. In memory device
102 are stored a netting matrix generation processing
program 112, an individual exposure calculating program 113,
a net exposure calculation processing program 114, and a
credit limit checking program 115.

[0010] First, to implement the processing of the present
invention, the following three items of information are
obtained. The first is contractual information (105) on
financial assets in the possession of the particular
financial institution or business corporation. The
contractual information indicates transaction conditions,
such as interest rates and terms of the individual contract
executed with the client for financial products, which is
information used in the course of calculating exposure to
an individual contract. The second is market information
(106) indicating market interest rates and actual exchange
rates, which is information used in the course of
calculating individual exposure to a contract. The third
is information on the master contract (107) executed with a
client for financial transactions, which comprises
contractual terms and the like, such as products open to
transaction, client positions, and house positions.

[0011] The processing that is implemented in the system based on the data that are obtained is conducted according to the process flow shown in Fig. 2. The various processes will be described below. Netting matrix generating program (112) that is present in the memory device automatically generates (201) netting matrix information (108) employing keys in the form of client transaction offices, house transaction offices, and types of products for which contracts are to be executed for each master contract unit from master contract information (107). In the netting matrix information that has been generated, a distinction of whether or not netting is possible is assigned to each combination of keys. Taking into account the need to make detailed settings with regard to, for example, whether or not netting is legally binding, the user of this system is permitted to confirm/correct this information on a screen.

[0012] Fig. 3 shows an example of a display/setting screen for netting matrix information. On this screen, the user selects a client for which settings are to be made from among a selection of clients (301). Given that there may be numerous clients, a client search function (303) is provided. Once the client has been confirmed, a table of master contracts that have been executed with the particular client is displayed in a master contract

selection (302). Once the master contract that is to be set has been selected from the master contract selection (302), whether or not netting is possible (307) is displayed for each combination of company office (304), client office (305), and contract product types (306) established based on master contract information. During automatic generation of the netting matrix, whether or not netting is possible is set by default to netting being possible (O). However, the user defines on this screen as (X) all combinations for which netting is not possible for legal reasons. In this process, the names of contracting groups are referred to as "ISDA," "IFEMA," "ICOM," and the like in the master contract selection.

[0013] Fig. 4 shows an image of a netting matrix. The netting matrix is a three-dimensional matrix having three axes in the form of house transaction offices (abbreviated to "company offices" hereinafter) 401, client offices 402, and contract product types 403. In the netting matrix, a netting flag indicating whether or not netting is permitted is set for each combination of company office, client office, and contract product type. When the netting flag is "1", netting is permitted, and when "0", netting is not permitted. The distinction of whether or not netting is permitted in the netting matrix is uniformly established by

determining the company office (401), client office (402), and contract product type (403). In the netting matrix in Fig. 4, for example, for the company office (401) TKY, the client office (402) TKY, and the contract product type (403) Swap, netting is "1", that is, netting is permitted. This corresponds to the line with a netting setting of "0" (line 1) for the company office (304) TKY, the client office (305) TKY, and the contract product type (306) Swap in Fig. 3.

[0014] Individual exposure calculating program (113) present in the memory of Fig. 1 calculates (202) an individual contract exposure (110) from contract information (105) and market status information (106). An example of the exposure table of an individual contract unit is shown in Fig. 5. Attribute information such as a company office (504), client office (505), and contact product type (506) for matrix identification in the netting matrix is maintained in the exposure of individual contract units. Numeral 507 denotes the calculated exposure.

[0015] Next, network exposure calculation processing program (114) in memory device (102) matches attribute information assigned to a given individual contract exposure and key items of the netting matrix, thereby aggregating the individual contract exposures in units of

company office (401) by client office (402) by contract product type (403). First, the transaction that is to be subjected to netting is determined (203). For transactions for which matching with the netting matrix is impossible and which cannot be subjected to netting for reasons such as the master contract not having been recorded, the absolute value of the exposure (when the exposure is positive, the value of the exposure, and when the exposure is negative, 0) for that particular individual contract is adopted, and subsequently simply added to conduct exposure gross total processing (207). When the transaction is one that has been recorded in a master contract, a determination is made as to whether or not netting is possible based on the netting flag (204). When netting is not possible, the absolute values of the individual contract exposures are adopted and simply added to conduct exposure gross total processing (205). When netting is possible, the individual contract exposures are simply added to conduct exposure netting total processing (206). Next, in the master contract unit net exposure calculating processing of step 208, the gross total result of step 205 and the netting total result of step 6 are added. In the client unit net exposure calculation processing of step 209, the gross total result of step 205, the netting total

result of step 206, and the gross total result of step 207
are added.

[0016] Fig. 6 is an image of the calculation results that
are outputted to the master aggregation unit: "An example
of detailed net exposure screen output". In this case, the
net exposure of lines 1 through 6 and line 9 and beyond
(those with a netting flag value of "1"), and the gross
exposure of lines 7 and 8 (those with a netting flag value
of "0") are subjected to A-BANK net exposure totaling. That
is, in the netting matrix, net exposures with a netting
flag value of "1" and gross exposures with a netting flag
value of "0" are totaled to obtain a net exposure. No image
of client unit output has been shown in the drawings.

[0017] Fig. 7 shows a "An example of a net exposure screen
output by master contract," which is an image of particular
detailed records that are aggregated by simple addition and
outputted in client units. For example, when the client
designation is A-BANK, for master contract ISDA92, the net
exposure is 1,000 and the gross exposure is 2,000. For
master contract IFEMA, the net exposure is 1,500 and the
gross exposure is 3,000. For master contract ICOM, the net
exposure is 1,200 and the gross exposure is 2,600. Here,
transactions for which there is no master contract have not

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been shown. For example, among A-BANK transactions, when there are transactions without a master contract, the value of the gross exposure of those transactions is added to the image.

[0018] Next, credit limit checking program (115) in memory device (102) conducts a credit limit check (210, 211). To compare the master contract unit net exposure with the credit limit, or to compare the client unit net exposure with the credit limit, the user employs credit limit checking program (115) to record and set the credit limits of master contract units or client units in advance.

[0019] The calculated master contract unit net exposure is subtracted from the credit limit of the recorded master contract unit (210). When the master contract unit net exposure is determined to be greater than the credit limit (211), transaction input prohibiting processing (212) is executed to output a warning message notifying the user of the fact that the master contract unit net exposure has exceeded the credit limit. Further, processing is prohibited for the client that has exceeded the particular credit limit so that the inputting of new transaction contract records and the inputting of transaction content changes such as the addition of net exposure are impossible.

[0020] Similarly, the calculated client unit net exposure is subtracted from the recorded client unit credit limit (210). When the client unit net exposure is determined to be greater than the credit limit (211), transaction input prohibition processing (212) is executed to output a warning message notifying the user of the fact that the client unit net exposure has exceeded the credit limit. Further, processing is prohibited for the client that has exceeded the particular credit limit so that the inputting of new transaction contract records and the inputting of transaction content changes such as the addition of net exposure are impossible. Fig. 8 shows an example of a warning message. The user is also notified by outputting a warning message to the effect that exposure is approaching the credit limit when the particular difference exceeds a certain ratio of the credit limit (for example, 70 or 80 percent).

[0021]

[Effect of the Invention] The present invention employs the above-described means to accumulate exposure taking into account roll over or netting over time, making it possible to rapidly handle batch account settlement netting processing. Further, it is also possible to implement

precise, detailed credit risk management operations based on actual business.

[Brief Description of the Drawings]

[Fig. 1] A block diagram of an embodiment of the present invention.

[Fig. 2] A flowchart of processing in the embodiment.

[Fig. 3] A drawing showing an example of the display of netting matrix information and a setting screen.

[Fig. 4] An image of a netting matrix.

[Fig. 5] An example of an individual contract exposure table.

[Fig. 6] An example of the output of a detailed net exposure screen.

[Fig. 7] An example of the output of a screen showing net exposure by master contract.

[Fig. 8] An example of a warning message output screen.

[Key to the Numbers]

101 Input device

102 Memory device

103 Central processing unit

104 Output device

105 Contract information file

106 Market information file

107 Master contract information file

108 Netting matrix information file

109 Credit limit information file

110 Individual contract exposure file

111 Net exposure information file

[Fig. 1]

Fig. 1
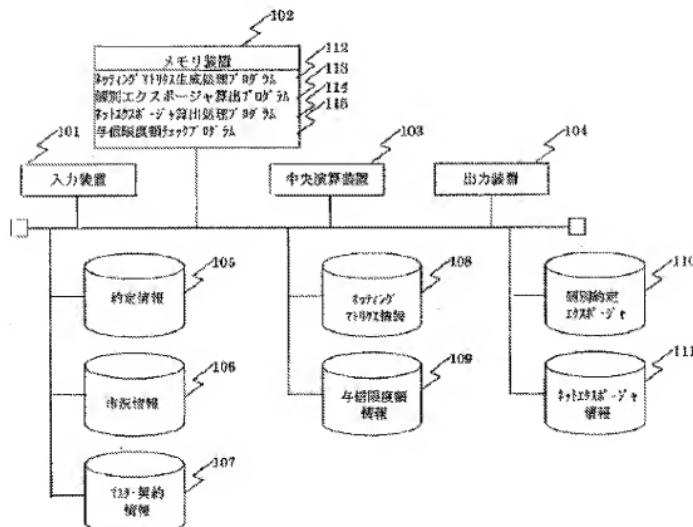
[(101) Input device (102) Memory device (103) Central
processing unit (104) Output device (105) Contract
information file (106) Market information file (107) Master
contract information file (108) Netting matrix information

file (109) Credit limit information file (110) Individual
contract exposure file (111) Net exposure information file
(112) Netting matrix generation processing program (113)
Individual exposure calculation program (114) Net exposure
calculation processing program (115) Credit limit checking
program]

[Fig. 4]

Fig. 4

Client: A-BANK

Master contract: ISDA92
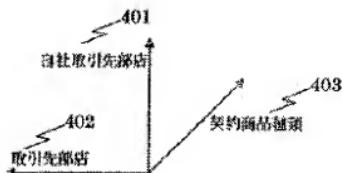
[(401) Company offices (402) Client
offices (403) Contract product type]

[Fig. 2]

Fig. 2

図 2


```
                        ┌──────────┐
                        │   開始   │
                        └────┬─────┘
         201                 │              202
  ┌──────────────┐    ┌──────────────┐
  │ ネッティング・ │    │   約定別     │
  │ マトリクス生成 │    │ エクスポージャ算出 │
  └──────────────┘    └──────┬───────┘
                             │        203
                      ╱ ネッティングの ╲      NO
                     ╲  対象取引である ╱ ──────────┐
                          │ YES                    │
                          │            204         │
              NO    ╱ ネッティング ╲               │
          ┌────────╲   可能である  ╱               │
          │             │ YES                      │
   205    │        206  │                207       │
  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
  │ エクスポージャの │  │ エクスポージャの │  │ エクスポージャの │
  │ グロス集計処理 │  │ ネッティング集計処理 │  │ グロス集計処理 │
  └──────┬───────┘  └──────┬───────┘  └──────┬───────┘
         208  │              │      209       │
  ┌──────────────┐      ┌──────────────┐
  │ マスター契約単位ネット │  │ 取引先単位ネット │
  │ エクスポージャ算出 │  │ エクスポージャ算出 │
  └──────┬───────┘      └──────┬───────┘
                 │   210
          ┌──────────────┐
          │   与信限度額   │
          │ チェック処理   │
          └──────┬───────┘
                 │         211
          ╱ 与信限度額を ╲     YES
          ╲ 超過している ╱ ──────────┐
                 │ NO                 │  212
                 │            ┌──────────────┐
                 │            │  取引入力の   │
                 │            │   禁止処理    │
                 │            └──────────────┘
          ┌──────────┐
          │   終了   │
          └──────────┘
```
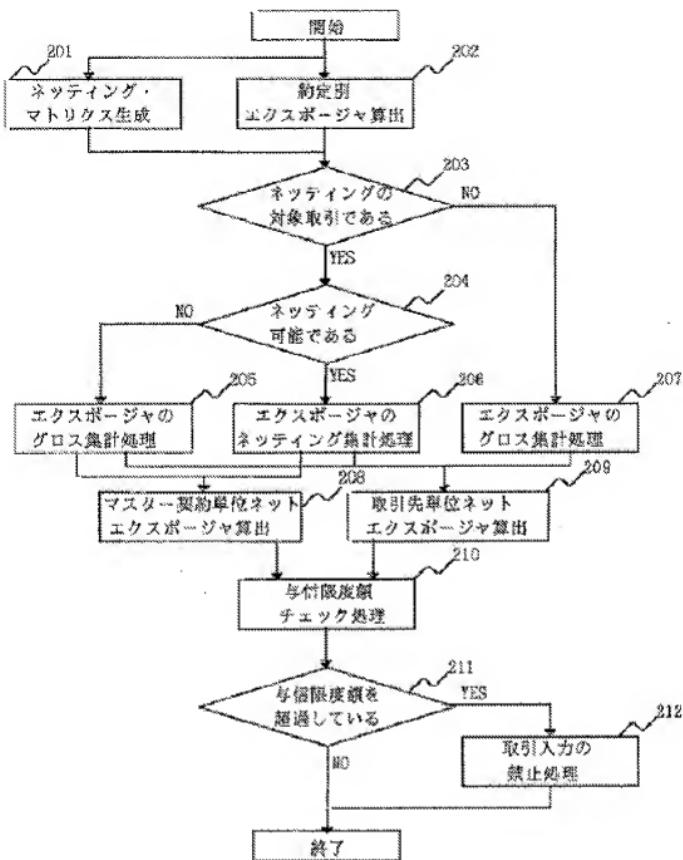
[(top) Start (201) Netting matrix generation (202)
Calculation of exposure by contract (203) Is transaction
subject to netting? (204) Is netting possible? (205)

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Exposure gross total processing (206) Exposure netting
total processing (207) Exposure gross total processing
(208) Master contract unit net exposure calculation (209)
Client unit net exposure calculation (210) Processing to
check credit limit (211) Has credit limit been exceeded?
(212) Processing to prohibit transaction input (bottom)
End]

[Fig. 5]

Fig. 5

約定番号	取引先	マスタ・契約	自社拠店	取引先拠店	契約商品種類	エクスポージャ
1001001	A-BANK	ISDA92	TKY	TKY		1,000
1001002	A-BANK	ISDA92	TKY	TKY		500
1001003	A-BANK	ISDA92	TKY	NY		400
....	......	......	......	......	......	......

[(501) Contract number (502) Client (503) Master contract
(504) Company office (505) Client office (506) Contract
product type (507) Exposure]

[Fig. 3]

Fig. 3

[(top) Establishment of netting matrix (301) Client selection (302) Master contract selection (303) Client search (304) Company office (305) Client office (306) Contract product type (307) Net setting (308) Remarks (309) Record (310) Return]

[Fig. 8]

Fig. 8

Warning message
Net exposure to Client "A-BANK" has exceeded the credit limit. New transactions with this client cannot be recorded.

[Fig. 6]

	601		602		

詳細ネットエクスポージャ

取引先選択　　　　　　　マスター契約選択

A-BANK	ISDA 92
A-BANK	ISDA92
B-BANK	IFEMA
C-BANK	ICOM
D-BANK	

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取引先検索

自社部店拠点	取引先部店拠点	契約商品種類	ネットエクスポージャ	グロスエクスポージャ
	604	605	606	607	608
TKY	TKY	Swap	1,000	2,000
TKY	TKY	FX	1,500	3,000
TKY	NY	Swap	1,200	2,600
TKY	NY	FX	1,000	2,100
TKY	LDN	Swap	1,100	2,600
TKY	LDN	FX	1,600	2,200
TKY	MDL	Swap	―	5,000
TKY	MDL	FX	―	6,000
NY	TKY	Swap	2,000	2,300
NY	TKY	FX	2,300	2,100
NY	NY	Swap	1,600	2,000
NY	NY	FX	1,200	2,700

A-BANK ネットエクスポージャ合計額：1,000,000   609

戻る   610

[(top) Detailed net exposure (601) Client selection (602)
Master contract selection (603) Client

search (604) Company office position (605) Client office
position (606) Contract product type (607) Net exposure
(608) Gross exposure (609) Total net exposure of A-BANK
(610) Return]

[Fig. 7]

取引先名	マスター契約	契約商品種類	ネットエクスポージャ	グロスエクスポージャ
A-BANK	ISDA92	Swap, FX	1,000	2,000
	IFEMA	FX	1,500	3,000
	ICOM	Currency option	1,200	2,500
B-BANK	ISDA92	Swap, FX	1,000	2,100
	IFEMA	FX	1,100	2,300
	ICOM	Currency option	1,600	2,200
C-BANK	ISDA92	Swap, FX	1,500	5,000
	IFEMA	FX	1,700	6,000
D-BANK	ISDA92	Swap	2,000	2,300
E-BANK	ISDA92	Swap, FX	2,300	2,100
F-BANK	ISDA92	Swap, FX	1,800	2,000
G-BANK	IFEMA	FX	1,900	2,700

[(top) Net exposure by master contract (701) Client
selection (702) Client search (703) Client name (704)
Master contract (705) Contract product type (706) Net
exposure (707) Gross exposure (708) Return]